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## Electron Wavefunctions and Densities for Atoms

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**Abstract.** With a special ‘Ansatz’ we analyse the regularity properties of atomic electron wavefunctions and electron densities. In particular we prove an a priori estimate,  $\sup_{y \in B(x, R)} |\nabla \psi(y)| \leq C(R) \sup_{y \in B(x, 2R)} |\psi(y)|$  and obtain for the spherically averaged electron density,  $\bar{\rho}(r)$ , that  $\bar{\rho}'(0)$  exists and is non-negative.